

What is claimed is:

1. A scanning microscope comprising at least one light source generating an illuminating light beam, an acousto-optical element for adjusting the optical power of the illuminating light beam, and further comprising a beam deflection device for scanning the illuminating light beam over or through a sample, wherein the acousto-optical element spatially splits a sub-light beam from the illuminating light beam; and beam guiding means are provided which direct the sub-light beam onto the sample, preferably to manipulate the same.
2. The scanning microscope as recited in Claim 1, wherein the acousto-optical element includes an AOTF (acousto-optical tunable filter).
3. The scanning microscope as recited in one of Claims 1 or 2, wherein a further beam deflection device is provided for scanning the sub-light beam over or through a sample.
4. The scanning microscope as recited in one of Claims 1 through 3, wherein an objective lens is provided which focuses the illuminating light beam onto the sample.
5. The scanning microscope as recited in Claim 4, wherein the objective lens focuses the sub-light beam onto the sample.
6. The scanning microscope as recited in Claim 4, wherein a further objective lens is provided which focuses the sub-light beam onto the sample.
7. The scanning microscope as recited in one of Claims 1 through 6, wherein the beam guiding means include an optical waveguide.
8. The scanning microscope as recited in one of Claims 1 through 7,

wherein the component that the acousto-optical element separates from the illuminating light beam as a sub-light beam is a component having a specific polarization property.

9. The scanning microscope as recited in Claim 8, wherein a polarization-controlling means is disposed between the at least one light source and the acousto-optical element.

10. The scanning microscope as recited in Claim 9, wherein the polarization-controlling means includes a  $\lambda/2$  plate.

11. The scanning microscope as recited in one of Claims 1 through 10, wherein compensation means are provided which compensate for spatial spectral dispersion of the sub-light beam and/or illuminating light beam caused by the acousto-optical element.

12. The scanning microscope as recited in Claim 11, wherein the compensation means include a prism and/or a grating and/or a further acousto-optical element.

13. The scanning microscope as recited in one of Claims 1 through 12, wherein the acousto-optical element directs detection light emanating from the sample to a detector.

14. The scanning microscope as recited in one of Claims 1 through 13, wherein the scanning microscope is a confocal scanning microscope.